

WHAT IS CLAIMED IS:

1. A fiber-reinforced article comprised of at least two plies wherein each of said plies comprises (a) rubber and (b) cord made from melt-spinnable, non-metallic, multifilament fiber, said cord having

5 a twist multiplier of less than or equal to about 375,
 a stress at 1% strain greater than or equal to about 1.7 grams/denier, and
 an initial compressive modulus greater than or equal to about 7 grams/denier,
 and

10 said at least two plies having a fiber orientation angle of greater than or equal to about 23° ^{cord} with respect to the longitudinal direction of the article

2. The article of claim 1 wherein said twist multiplier is less than or equal to about 310.

15 3. The article of claim 1 wherein said initial compressive modulus is greater than or equal to about 9 grams per denier.

20 4. The article of claim 1 where said fiber orientation angle of said at least two plies is greater than or equal to about 26° .

^{cord} in which said at least two plies are

25 5. The article of claim 1 comprising three plies wherein two plies have said fiber ^{cord} orientation angle of about 30° and the third ply has a fiber orientation angle of about 0° .

6. The article of claim 5 wherein said third ply has said cord at 4 to 20 ends per inch.

^{cord} in which said at least two plies are

30 7. The article of claim 1 comprising four plies wherein two plies have said fiber ^{cord} orientation angle of about 23° and two plies have a fiber orientation angle of about 45° .

^{cord} the inner two of

8. The article of claim 7 wherein said two inner plies have said cord at 4 to 20 ends per inch.

9. The article of claim 1 wherein said cord is made from polyethylene naphthalate.

10. The article of claim 1 having fiber reinforcement in a third dimension.
11. The article of claim 10 wherein said third dimension of reinforcement comprises stitches or folds.
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~~12. The article of claim 11 wherein said stitches comprise continuous chain, zigzag or cross-stitch.~~
13. The article of claim 11 wherein said folds form the edges of the longitudinal direction of the composite.
10
*said third dimension of reinforcement comprising
folds
and*
~~14. The article of claim 11 wherein said third dimension is formed by braiding.~~
15. The article of claim 1 wherein said article has substantially no cut cord ends along its longitudinal edges.
16. The article of claim 1 wherein said cord further comprises said cord having a denier per filament of greater than or equal to about 2.
20. 17. The article of claim 1 said cord further comprises said cord having an initial tensile modulus of at least about 165 grams per denier.
18. The article of claim 1 wherein said article has an in-plane shear modulus of at least about 730 pounds-force per inch.
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19. The article of claim 1 wherein said article has an in-plane shear modulus of at least about 830 pounds-force per inch.
30. 20. The article of claim 1 wherein said article has a fatigue of at least about 2700 cycles to failure.
21. The article of claim 1 wherein said article has a fatigue of at least about 5500 cycles to failure.
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22. The article of claim 1 wherein said article is a tire belt.

WHAT IS CLAIMED IS:

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1. A fiber-reinforced article comprised of at least two plies wherein each of said plies comprises (a) rubber and (b) cord made from melt-spinnable, non-metallic, multifilament fiber, said cord having

5 a twist multiplier of less than or equal to about 375,
a stress at 1% strain greater than or equal to about 1.7 grams/denier, and
an initial compressive modulus greater than or equal to about 7 grams/denier,
and
10 said at least two plies having a fiber orientation angle of greater than or equal to about 23°.

2. The article of claim 1 wherein said twist multiplier is less than or equal to about
310.

15 3. The article of claim 1 wherein said initial compressive modulus is greater than or
equal to about 9 grams per denier.

SAC
20 4. The article of claim 1 wherein said fiber orientation angle of said at least two plies is
greater than or equal to about 30°.

25 5. The article of claim 1 comprising three plies wherein two plies have said fiber
orientation angle of about 30° and the third ply has a fiber orientation angle of about
0°.

6. The article of claim 5 wherein said third ply has said cord at 4 to 20 ends per inch.

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30 7. The article of claim 1 comprising four plies wherein two plies have said fiber
orientation angle of about 23° and two plies have a fiber orientation angle of about 45°.

8. The article of claim 7 wherein said two inner plies have said cord at 4 to 20 ends
per inch.

9. The article of claim 1 wherein said cord is made from polyethylene naphthalate.

10. The article of claim 1 having fiber reinforcement in a third dimension.

Sub B1
11. The article of claim 10 wherein said third dimension of reinforcement comprises
stitches or folds.

12. The article of claim 11 wherein said stitches comprise continuous chain, zigzag or
cross-stitch.

13. The article of claim 11 wherein said folds form the edges of the longitudinal
10 direction of the composite.

Sub B1
14. The article of claim 11 wherein said third dimension is formed by braiding.

15. The article of claim 1 wherein said article has substantially no cut cord ends along
its longitudinal edges.

16. The article of claim 1 wherein said cord further comprises said cord having a
denier per filament of greater than or equal to about 2.

20 17. The article of claim 1 said cord further comprises said cord having an initial tensile
modulus of at least about 165 grams per denier.

18. The article of claim 1 wherein said article has an in-plane shear modulus of at least
about 730 pounds-force per inch.

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19. The article of claim 1 wherein said article has an in-plane shear modulus of at least
about 830 pounds-force per inch.

20. The article of claim 1 wherein said article has a fatigue of at least about 2700
30 cycles to failure.

21. The article of claim 1 wherein said article has a fatigue of at least about 5500
cycles to failure.

35 22. The article of claim 1 wherein said article is a tire belt.

23. A tire comprising a belt in accordance with claim 1.

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5 24. A tire comprising a belt in accordance with claim 9.

25. A method of making a tire comprising the step of:
incorporating the fiber-reinforced article of claim 1 therein.

26. A method of making the article of claim 13 comprising the step of:
10 folding a unidirectional composite sheet (79) in a spiral manner to produce a
composite having continuous fiber reinforcement and uncut, folded edges.

27. A method of forming an annular object comprising the steps of:
15 folding the article of claim 13 into a ring shape,
overlapping the ends (107 and 109) of said article,
causing one of said ends to have a notch (111) and the second of said ends to
have a reciprocal flap (113), and
folding said flap into said notch,
wherein said annular object has no cut cord ends along its circumferential edges.

20 28. A method of making the article of claim 12 comprising the step of:
stitching together said two or more plies.